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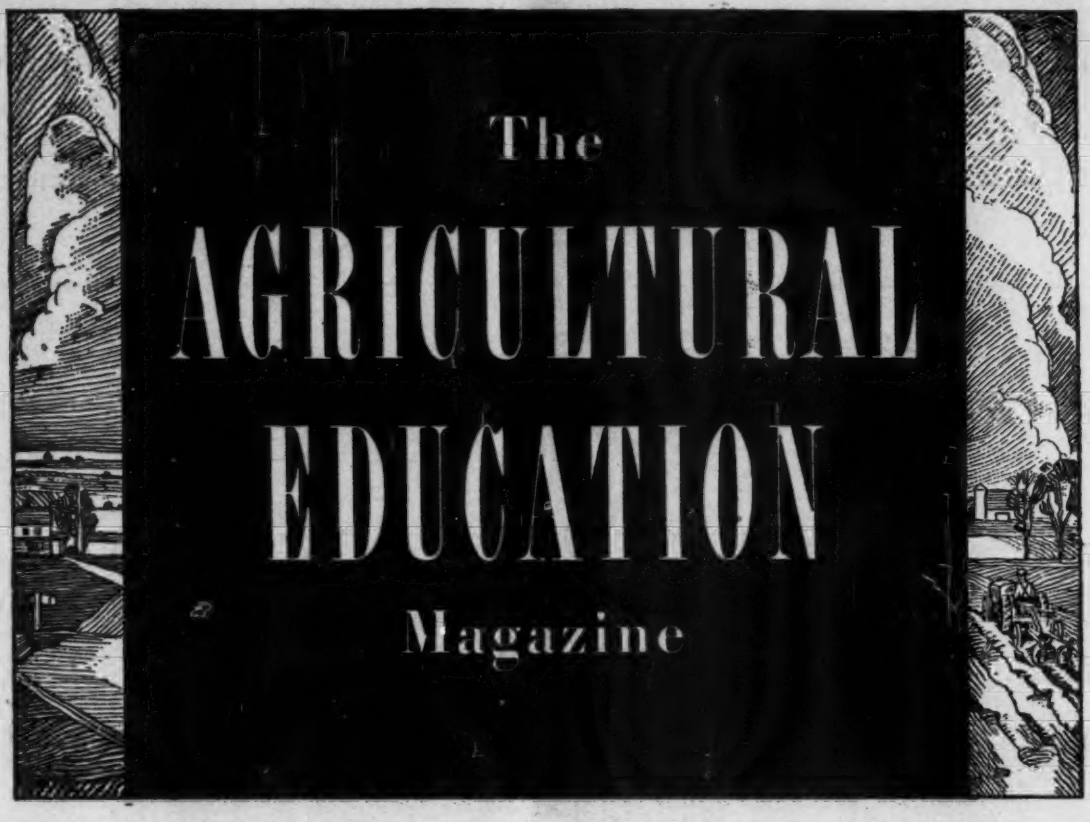
Vol. 13 February, 1941 No. 8



IT BECOMES increasingly evident that now, more than ever before, a democratic country needs a pooling of ideas in order to make the best possible decisions
—Clyde R. Miller, Columbia University

VOCATIONAL AGRICULTURE
For
TEACHERS
Teacher-Educators
And Supervisors
OFFICIAL PUBLICATION

The Agricultural Education Magazine

A monthly magazine for teachers of agriculture. Managed by an editorial board chosen by the Agricultural Section of the American Vocational Association and published at cost by the Meredith Publishing Company at Des Moines, Iowa.

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Entered as second-class matter, under Act of Congress, March 3, 1879, at the post office, Des Moines, Iowa.

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Editorial Comment

Let Us Examine a Tradition

RECENTLY from a number of quarters there have come intimations that the modern program of the teacher of agriculture is too large for the typical person to execute. It has been pointed out that enrollments are high. All-day, part-time, and evening-school work are being carried on, in addition to the work of the F. F. A., the community service program, and many other phases of agricultural education.

Altho there are many school systems that could and should employ more than one teacher there is little prospect of increased local, state, and Federal funds to increase man power in most schools. The demands on state and Federal funds for other purposes and the priority of claim of communities not yet serviced by departments of vocational agriculture would make it appear that most departments will have but one man to do the work for some time to come.

In expanding programs of vocational agriculture, additions have been made at the higher levels, namely by providing classes for young farmers and adult farmers. With one or two exceptions, however, little thought has been given to the possibility of lightening the load at the lower end. In practically every state four years of vocational agriculture are offered, beginning with the ninth grade. In fact, the National Committee on Standards has indirectly set up its evaluative criteria in such a way as to devaluate a program that does not start with the ninth grade. Altho the offering of vocational agriculture to freshmen a quarter of a century ago had its justification there are good reasons why the advisability of beginning vocational education in agriculture at the senior high-school level should now be considered.

In 1917 only a small percentage of farm boys continued in school beyond the eighth grade. This was due, in part, to the non-functioning and unprofitable curricula then offered in high schools. It was felt that vocational agriculture in the ninth grade would keep farm boys in school. At that time the schools had little, if anything, in the way of a program of vocational guidance. If the teacher of agriculture had no contact with farm boys during the first year of school it was believed that potentially good farm boys would take courses of little value to them later as farmers. The four-year high school was the typical high school.

Another factor present at that time was the almost total absence of continuation education following termination of formal schooling. Since the only systematic instruction in agriculture available to "present and prospective farmers" was in the regular high school it was thought wise to offer four years of such instruction. Altho rapid strides have been made in the development of programs of continuing education there are vast numbers of teachers who have not extended their instruction beyond the day-school group. How many of those who are not now providing much-needed instruction in agriculture for out-of-school groups would do so if their day-school load could be lightened?

Many of the conditions responsible for the four-year program no longer exist or are greatly modified. The great majority of youth of high-school age now continue in school beyond the eighth grade. There have been real improvements in the non-vocational curricula of our high schools. We have the beginnings of sound vocational guidance programs in many high schools. It is now recognized by many educators that the teacher of agriculture alone cannot be shouldered with the responsibility of providing vocational guidance for farm boys, but that it is a responsibility of the whole school staff. Increasingly, the ninth grade is being regarded as a part of junior high school or pre-secondary education. Many administrators believe that in the seventh, eighth, and ninth grades there should be an emphasis on exploratory and pre-vocational activities rather than on vocational training.

As we approach the time when each department of vocational agriculture provides young-farmer and adult classes, farm boys will have an opportunity to study agriculture "when they need it" and can profit more from it.

Research studies have shown that there is a high mortality in classes in vocational agriculture after the first year of high school. Many teachers frankly admit that the first year is an orientation year and that true vocational training begins the second year. Are these teachers attempting to do something for which the entire school staff should be responsible—the guidance of high-school young men?

We are not advocating that all schools should move the first year of vocational agriculture forward one year, but there is need for re-thinking on this matter. One reason why vocational education in agriculture has succeeded is that it has been less hampered by tradition than have most academic subjects. It is well to examine carefully a procedure or practice that cannot be justified on sound educational principles, rather than to attempt to justify it on the ground that "it has always been done this way." Perhaps there is need for reconsidering the question of when to begin the "training of prospective farmers." Especially is this necessary if we are to make it possible for teachers to put first things first.

Teachers Should Be Scientific Realists

THE great challenge to the teachers of this nation, and of all democratic nations, is to develop those ideals, abilities, and skills that will make for social and civic strength and for economic security. This will not be easy because many of the seeds that have brought forth bitter fruit in the political world have also grown in the field of education. The eating of this fruit has left a few of us muddled and addled. It has caused some to turn either to agnosticism or cynicism on the one hand, or to gullibility or sentimentalism on the other.

The muddled have heard that they should educate for democracy, and not knowing what democracy really is, have educated for anarchy.

The addled were told that they should provide for individual differences, and they have forgotten all about the values that come from socialized recitations.

The gullible have heard about the need for cutting across subject matter fields, and have ignored the fact that interest and understanding are associated with internal relationships of knowledge.

The sentimentalists have read that they should respect the personality of the child and not interfere with his natural development, and have allowed their pupils to grow up undisciplined and ill prepared for the world in which they will have to live and work.

The cynics and agnostics are usually those who were for a time too credulous and who fell for all the fads that came to their notice; they now see little good in anything either old or new.

This is a time when teachers should keep their heads even tho those about them are losing theirs. We should be scientific and practical realists. We must choose practical objectives and methods that can be used in a social order as it is and with people as they are. It is well to aim high and have visions but it is also important to find out what can be done and how to do it.

Teachers of agriculture have always been known for their clear thinking and their use of effective methods of instruction. It should be the aim of teachers to continue this tradition and to set an example of what is best in education. We can do this if we approach our problems with a scientific attitude and not with gullibility; if we do our work with confidence that we are serving mankind and not with a feeling of despair; and if we are realists rather than sentimentalists or faddists in planning our programs and in carrying them to a successful conclusion.—Barton Morgan, Iowa.

ONLY part of what the drafted man learns during his year in the army will be usable when he returns to civilian life. On the other hand, the fortunate youth who learns a "defense" trade doubtless will find his skill in demand thru his entire working career. . . Wars are fought at the foundry, smelter, retort, test tube, lathe, and workbench, as well as in the air, on the sea, in trenches and forts, or along battle lines.—San Antonio Express, October 4, 1940.

A. K. GETMAN **Professional** R. W. GREGORY

Farm Research Narratives

Dairy Cattle Nutrition

G. P. DEYOE, Associate Professor of Education, Michigan State College

and

C .F. HUFFMAN, Research Professor of Dairy Husbandry, Michigan State College

G. P. Deyoe

IN AGRICULTURE as in other fields, many ideas believed to be the final word have been knocked into the proverbial cocked hat when submitted to the acid test of experimental research. As a result of this approach, many ideas in the nutrition of dairy cattle have been found vulnerable. The findings from certain experiments in this field at Michigan State College have contributed considerably to the exposure of some of the fallacies in the feeding of dairy cattle, and in addition they have led to marked improvements in theory and practice.

The research work in dairy cattle nutrition under consideration in this article had its inception at Michigan State College in 1922 when C. F. Huffman came to this institution. This research program under his direction has been characterized by long-time feeding experiments based on significant problems of current interest to dairy farmers in Michigan and elsewhere.

The first experiment of special importance was designed to study mineral requirements and the effects of feeding different mineral supplements, since at that time the country was being flooded with complex mineral feeds for which many questionable claims were being made.

The next important experiment involved a study of cottonseed meal as a protein supplement for dairy cows. This was a significant experiment at the time because some protein concentrate was needed to supplement the low-protein roughages which predominated prior to the introduction of alfalfa as an important forage crop. Cottonseed meal was the cheapest protein supplement available at the time, but it was in disrepute because of its alleged toxic effects.

The third experiment of significance involves the study of the nutrient value of alfalfa hay, and is of special importance because alfalfa has taken first place as a hay crop in many sections of Michigan. This experiment has been in progress 12 years and the plans at present are to continue it for several additional years, as findings to date and problems yet unsolved in connection with it are of extreme significance in the field of dairy cattle nutrition.

Mineral Requirements and Effects From Feeding Minerals

The experiments on mineral requirements and the effects from feeding minerals were started in 1922 and continued for six years. The cows used were procured as calves and all were of similar breeding. Most of these animals were continued on experiment for three lactation periods, thereby making this the initial long-time experiment in dairy cattle nutrition in this country. The entire group of cows had an average level of productivity of over 9,000 pounds of milk and about 300 pounds of butterfat in 305-day lactations.

C. F. HUFFMAN

A basal ration consisting of high-grade timothy hay, corn silage, and a grain mixture low in calcium (corn, oats, and cottonseed meal) gave splendid results over a period of five years. (Salt and water were allowed in addition in all experiments.) Short-time metabolism trials thruout lactation indicated that altho the cows were on negative calcium balance during heavy production, they stored ample calcium during medium and low production and during the dry period. At the end of three lactations, the animals were slaughtered and the bones were found to be normal.

Other groups of animals fed the basal ration supplemented with bone meal or finely ground limestone rock did no better from the standpoint of reproduction, milk production, and bone development than the cows on low calcium ration.

One group of animals received a cheap mineral supplement consisting of equal parts of finely ground limestone rock and raw rock phosphate. The health of this group was adversely affected. The teeth were badly worn and the long bones showed marked changes. It was later shown that the detrimental factor in this mineral supplement was the presence of fluorine in raw rock phosphate. Up to this time, raw rock phosphate had been recommended as a cheap source of calcium and phosphorus.

With one group, a highly advertised complex mineral mixture was used in accordance with the recommendations of the sponsors. This mixture injured the health of the animals to which it was fed, altho high claims had been made for it.

One group had the basal ration of timothy hay, silage, and grain mixture in winter displaced by pasture in season. The consumption of pasture grasses did not give any "kick" to milk production, thus indicating that the barn ration carried all the necessary factors for satisfactory production.

In one phase of the experiment, timothy and alfalfa were contrasted as sole roughages. In each case the grain mixture was adjusted in protein to fit the roughage. No mineral supplements were used except salt. The timothy group did as well as the alfalfa group.

Some of the significant implications of these experiments are as follows:

1. Cattle do not suffer from a calcium deficiency even when low-calcium roughages are used, provided the roughages are palatable and fed in large amounts.
2. Calcium can be utilized efficiently on a good barn ration, even tho it has been claimed (and still is claimed by some) that cows will restore their calcium balance only on good pastures. (Metabolism tests in these experiments showed that cows could utilize 50 to 60 percent of the calcium in the ration, when needed.)
3. When cows are fed a good carrier of phosphorus, such as cottonseed meal, no additional source is needed. Under conditions where additional phosphorus is desirable, bone meal as a source is much preferable to raw rock phosphate, since the latter may contain fluorine which has a toxic effect.
4. Dairy cows do not require complex mineral mixtures. In fact, some of the high-powered, high-priced, and highly advertised mixtures may be detrimental.

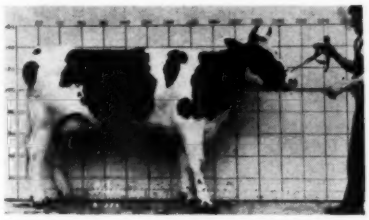
It is interesting to note that one college of agriculture in the Middle West started an experiment to refute the above findings, as some of the results of its previous experiments were in conflict. However, the forthcoming results proved to be similar to those obtained at Michigan State College.

Cottonseed Meal as a Feed for Dairy Cattle

An experiment with cottonseed meal in the dairy ration was quite significant at the time, since dairy farmers were in need of a low-priced protein concentrate to balance the prevalent roughages which were low in protein. This was a three-generation experiment which lasted for 10 years.

As the upshot of this experiment, it was found that enormous quantities of cottonseed meal over a long period of time could be fed without injurious results to the cows, provided the quality of roughage was good. (In these experiments, timothy hay and corn silage were used along with cottonseed meal as a basal ration. Water and salt were allowed in all cases.) As much as 17 pounds of cottonseed meal were fed per cow per day in the course of this experiment, with no injurious results. In addition to this finding, cottonseed meal was shown to be laxative rather than constipating in effect.

One group of cows fed on straw, silage, and cottonseed meal had dead calves or calves which were weak and blind. The blindness was found to be associated with constriction of the optic nerve where it passes thru the skull. (Further studies being continued by L. A. Moore have correlated this type of blindness with a lack of carotene in the ration of the dam.)



The first cow in experiments at Michigan State College to receive alfalfa alone as a ration (salt and water also available). Productive level on good ration was about 400 pounds of butterfat but this was reduced to about 200 pounds on the alfalfa ration. This was the key animal in present experiments, as it led to a further study of the deficiencies of alfalfa hay.

This experiment with cottonseed meal was a very significant one at the time it was started. However, the results were not very vital by the time it was completed, since alfalfa was being adopted more widely as a hay crop and thereby the need for protein supplements in dairy rations was reduced considerably. Nevertheless, this experiment led to other important investigations, such as the one on carotene deficiency previously mentioned and further work on the nutritive value of roughages.

Nutrient Value of Alfalfa Hay

At Michigan State College, the third long-time experiment of special significance in dairy nutrition involves the study of the nutrient value of alfalfa hay. While this experiment has been going for 12 years and several important findings have accrued to date, it is being continued into the future in an attempt to find solutions for problems as yet unsolved and in part suggested as the experiment has developed.

One part of this experiment was designed to determine the phosphorus requirements when the ration consists of alfalfa hay and the common cereal grains (corn, barley, oats) with and without corn silage. (Salt and water are provided in all rations.) This investigation was in part inspired by the fact that dairymen in several sections of Michigan who fed alfalfa and the cereal grains reported depraved appetites of the cows, as characterized by chewing bones and wood. The tremendous increase in alfalfa acreage in Michigan made this problem an important one. It was found that this condition could be relieved by the simple expedient of feeding bone meal, and the results led to the recommendation that cows can be nourished on a simple home-grown ration of alfalfa hay and the cereal grains with or without silage if they are allowed free access to a mixture of equal parts of bone meal and salt.

Dr. C. F. Huffman received one of the first two Borden awards made annually to men who have performed meritorious work in science as it is related to dairying.

In his work at Michigan State College, Doctor Huffman gives credit for the able assistance and whole-hearted support of several men with whom he has been associated, including O. E. Reed, now Chief of the Bureau of Dairy Industry, U.S.D.A., C. S. Robinson, now of Vanderbilt University, E. L. Anthony, Dean of Agriculture at Michigan State College, Earl Weaver, Head of Department of Dairy Husbandry, C. W. Duncan and E. J. Miller of the Section of Experimental Chemistry, E. T. Hallman of the Section of Animal Pathology, L. A. Moore of the Department of Dairy Husbandry, and his graduate assistants.

Certain of the findings in this roughage experiment have led to new thumb rules for feeding alfalfa hay, corn silage, and grain. On a limited grain ration, it has been demonstrated that cows will eat three pounds or more of dry roughage daily per 100 pounds of live weight, as contrasted with the old thumb rule of two pounds. With silage in the ration, the hay equivalent can be figured in terms of one pound of hay to three pounds of silage. Thus, a 1,200 pound cow will usually eat at least 24 pounds of alfalfa hay and 36 pounds of silage, or 36 pounds of alfalfa hay if no silage is fed, or some other combination figured accordingly. These experiments have shown that up to five or six pounds of grain per day can be fed to each cow and still maintain a high consumption of roughage.

One of the aspects of the roughage experiment which is being given current attention is the attempt to find out why some alfalfa hays fail to provide productive energy value in proportion to their total digestible nutrients. A new technique of study is being used in an attempt to discover the factors responsible for this situation. After freshening, cows are put on a ration of alfalfa hay and fed nothing else until they show a marked drop in milk production, which has usually happened on most alfalfa hays used to date. When this marked decline in production occurs, the alfalfa hay is reduced and an equivalent amount of total digestible nutrients is introduced by feeding corn meal. This combination usually results in a marked increase in production with cows having an inherent capacity for fairly high production.

The problem at present is to find the specific factor (or factors) in corn which accounts for the step-up in production. At first it was thought that it might be fat, but non-fat foods such as beet pulp have produced the same pick-up in production as corn meal. Corn oil, cottonseed oil, or soybean oil has not given this response. This shows that fat, *per se*, is not a factor in explaining the deficiencies of alfalfa hay in exerting its highest nutritive values. (This refutes the claim that a grain mixture should contain four percent fat, which is advocated in some sections of the United States.) Cystine and dried skim milk have both been tried without results. The failure of the latter to give the necessary "kick" to production apparently eliminates a lot of possible factors which might explain the deficiencies of alfalfa hay.

This cow produced 425 pounds of butterfat, as a three-year old, on a ration of alfalfa hay and corn (with salt and water.) This indicates the value of a small amount of cereal grain to offset certain deficiencies (as yet unknown) of alfalfa. On alfalfa hay alone, this cow would produce about half the amount indicated.

The isolation of the factor or factors in the situation under discussion is the "big thing" in animal nutrition today, because of the tendency to feed rations high in roughage. Nutrition specialists for a long time have wondered why roughages do not exert their full nutritive power even tho they appear adequate from the known dietary factors. Thus, the implications of this and other experiments are enormous and have most others "backed off the map" in importance. Perhaps, when the answer is found, it will be possible to reduce markedly the amount of feed required over and above a roughage such as alfalfa hay.

Some of the significant findings of the roughage experiment are:

1. Possibilities are shown for feeding dairy cows a simple ration which consists largely of home-grown feeds. In such rations, with limited amounts of cereal grains, roughage consumption can be kept at a high level, and thereby it is possible to produce more pounds of milk per acre with less cash out of the pocket. In addition to salt, it is frequently desirable to include some bone meal in such a ration.

2. The traditional thumb rules for feeding roughage and concentrates may need revision in terms of what a cow will actually consume for optimum productivity. More roughage and less grain are probably needed than the current thumb rules indicate. Cows will eat three pounds or more of hay equivalent per hundred pounds of live weight daily, on a limited grain ration, and produce satisfactorily.

3. Alfalfa as the sole ration is unsatisfactory and does not exert its maximum nutritive value. The specific factor (or factors) which accounts for this are as yet unknown, but to date the experiment suggests important clues which may lead to their discovery.

Other Experimental Activities in Dairy Cattle Nutrition

Another experiment worthy of special mention involved a study of rickets and Vitamin D deficiency. In order to study the calcium and phosphorus relationship more effectively, the Vitamin D requirements of calves and the Vitamin D value of solar radiation, sun-cured hay, corn silage, irradiated milk, cod liver oil, and irradiated ergosterol have been studied. One of the most significant observations in connection with Vitamin D and phosphorus deficiency studies has been the effect on the articulating cartilages found in joints. The effects in early life of deficiencies of phosphorus and Vitamin D persist even tho ample amounts of these materials are supplied later. This exists in the form of pitting and erosion of the articulating cartilages and gives rise to the name of "creep" which describes the creeping sound due to rubbing of bone against bone in the joint. Micro-organisms may lodge in such areas and produce arthritis. Thus, the results of these experiments are not only of value in relation to feeding dairy cows in alfalfa areas but also they may have application to humans.

Experiments are in progress to study the effects of magnesium deficiency in the ration of calves. Long-continued feeding of rations deficient in magnesium results in hardening of blood vessels and injury to the kidneys and heart. In working out the magnesium requirements of calves, it has been found that they correspond pound for pound of body weight with those of a child. While the results of this experiment do not have a practical application to farm conditions at the moment, due to the high magnesium content of common dairy feeds, they may have an important application to humans who receive insufficient magnesium such as may be the case if the diet consists primarily of refined foods.

Other experiments in progress include the study of the effects of fertilization and stage of maturity on the nutritive value and palatability of pasture and hay crops. Experiments also are under way to discover methods for utilizing maximum amounts of cull beans and soybeans in dairy rations, and to determine the value of silages made from legumes and various grasses.

The study of various aspects of feed utilization has been facilitated greatly by the use of "rumen fistula" cows. By a rather simple operation, it is possible to provide an external opening directly to the rumen (i. e., "rumen fistula") with little or no discomfort to the cow. By proper techniques, this opening is retained as long as desired. Direct access is thereby provided to the contents of the rumen, which facilitates the study of rumen digestion, gas formation, and rumen capacity.

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(Continued on page 158)

How Can We Identify Our Prospective Farmers in the High School?

H. M. HAMLIN, Teacher Education,
Urbana, Illinois

H. M. Hamlin

FEDERAL funds for agricultural education are appropriated for use with persons who are engaged in, or who expect to engage in farming. We are becoming increasingly aware that in many high schools there are pupils on whom we are spending these funds who do not later on engage in farming. The justification for including such persons in our classes must be either (a) that they are currently engaged in farming, as many farm boys may actually be, or (b) that we cannot tell at the high-school age who will later become farmers.

One Illinois teacher, interested in this problem of selecting high-school boys for vocational agriculture classes, made a study during the summer of the graduates of his department during the 23 years it has been in operation. He found these 158 graduates distributed occupationally as follows:

	Boys from Farms		Urban Boys		All Boys	
	No.	%	No.	%	No.	%
Farming	31	35.2	0	0.0	31	19.6
In related agricultural occupations	7	7.9	5	7.1	12	7.5
In non-agricultural occupations	50	56.9	65	92.9	115	71.9
Totals	88	100.0	70	100.0	158	100.0

Only a fifth of the boys enrolled during the life of the department were engaged in farming, the occupation for which they were supposed to have been prepared. More than two-fifths of the boys who had been enrolled were urban boys; not one of these was engaged in farming and only seven percent of them were engaged in occupations related to farming.

Another Illinois teacher, Mr. H. C. Erwin of Sullivan, found that 90 percent of the boys enrolled in classes in vocational agriculture during the 12 years the department has been established and he has been the teacher, who have left school, are now engaged in farming.

Probably both of these are extreme cases. It would be good for any community to have the facts on this point for its own situation. They might prove to be quite as surprising.

Predicting the Probability of Engaging in Farming

We do not know as much about predicting whether a high-school boy will farm as we should know nor as we probably shall know in a few years as a result of studies now under way. However, it seems safe to state that enough is known to enable us to make our selections in such a way that approximately three fifths of those we enroll will subsequently farm and three fourths will engage in some sort of agricultural occupation.

It has been known for a long time that few town-reared boys ever farm. There have been many studies involving thousands of cases; none with which I

am familiar has ever shown more than 10 percent of the town boys turning to farming, whatever the number of years of instruction in vocational agriculture they have received.

We are becoming better able to predict which farm boys are likely to become farmers. There is agreement among the findings of a number of studies that those most likely to become established in farming are the following:

1. Boys who conduct average, or better than average farm-practice programs.
2. Boys who are related to persons with farms, and who are on good enough terms with their relatives to receive their assistance.
3. Boys from small families (particularly boys with no brothers or with only one brother).
4. Boys from average or better-than-average farms in average or better-than-average communities.
5. Boys who continue their study of vocational agriculture thru three or four years.

The studies on which our predictions have to be based are, of course, studies of the past. Conditions are changing. Opportunities to become operators of general farms are decreasing. Part-time and specialized farmers are increasing. The number of occupations other than farming which call for agricultural background and training is increasing. There may be fewer opportunities for farm boys and more opportunities for town boys who are agriculturally trained than the past has provided. We must more and more look, not to the past, but to the future for our guidance.

Mr. W. L. Newport of Hamilton, Illinois, has just completed a study of the process of establishment in farming in his community which combines two townships. He has found that during the past five years, the average number of new farm operators has been six per year. Taking this figure as a guide, it is possible for him to estimate the number of boys who may be encouraged to train for farming, since it is well known that up to now, with few exceptions, boys farm in their own communities if they farm at all. It would appear that, if such a procedure were used, the enrollments in our high-school classes in vocational agriculture might be considerably reduced.

Factors Affecting the Number of Opportunities

We are also confronted with the probable effects of a falling rural birth-rate upon the selection of boys for farmer training. One Illinois teacher has estimated on the basis of a recent study that in the near future the average number of bonafide vocational-agriculture students coming into his school each year will be two. This is an extreme situation, but others approach it. The temptation under such circumstances is to fill the high-school classes with boys who have no real prospects of becoming farmers. The wiser course would be to reduce the emphasis on the high-school phase of the vocational-agriculture program, to provide non-vocational agriculture for those who want to study agriculture but do not wish to become farmers, and to expand greatly the part-time and evening-school programs. This is the course this particular teacher is taking. He is meeting with a fine response from the adults in his community. Other teachers, less foresighted, are jeopardizing the vocational-agriculture programs in their communities by failing to make these adjustments in time.

We must be careful in our selection of boys for farmer-training and in our guidance of boys regarding farming occupations, not to play too much into the hands of the "haves" as against the "have nots." I have already indicated that boys from small families and those related to persons who own farms have considerable advantage in getting established in farming. But perhaps this is not as it should be. Our influence should be exerted to provide something like equality of opportunity for land ownership and for other forms of land tenure. Nothing in agriculture is more basic than the questions of who shall possess the land and on what terms. The fate of democracy in our rural areas depends to a considerable extent on the answers to these questions. We teachers must not be aligned with the status quo in the determination of the answers. There is much that society can do to make land available to those who could manage it well but who lack the initial advantages now commonly required to secure it. The tenant-purchase plan, as one step in this direction, should be carefully studied by teachers of agriculture and by students alike.

What of Young Men Who Cannot Locate on Farms?

We are passing out of a period when the future in non-agricultural occupations was dark and the movement was toward the farm, rather than away from it. Rural sociologists are again telling us that we have a great surplus of farm population and that only a low standard of living can be the general lot of farmers as long as this continues. Teachers of agriculture will do all concerned a great service by diverting some of their prospective students into other fields and by working for the provision in their school systems of opportunities for special training for non-agricultural fields, particularly for industrial work. The establishment of regional trade and industrial schools for farm and village boys would help a great deal in caring for our surplus rural population. We may be on our way to a permanent system of such schools as a result of the national defense program of trade and industrial education.

In spite of all of the facts pointing in the opposite direction, there are still some teachers of agriculture who are obsessed with the ideas which prevailed before and during the First World War, that it is the function of agricultural education to "keep boys on the farm" and to insure that the nation does not starve by maintaining or increasing the farm population. Such teachers "beat the bushes" for all possible prospects for their classes and pride themselves on having all, or nearly all of the farm boys in the high school and many others in their classes. They talk about the farm being the best place in the world to live, about agriculture being the most essential industry, and about the farmer being the most important and useful of all workers. This is largely an emotional approach to the problem, which ignores many facts. It largely fails because the boys and their parents recognize it as unrealistic. There is no civic virtue in adding more farmers to contribute to perennially increasing surpluses of farm products. There is no hope that the farm may become (or remain, if you prefer) the best place to live so long as these surpluses continue to increase. On the other hand, there are continuing shortages of skilled workers in many occupations as essential as farming. Why not divert some of our boys into them?

It is true that the farms can absorb an indefinite number on a subsistence basis. But subsistence farming does not provide the good life which rural idealists say should be expected by those who remain on the farm. In the kind of world in which we live, the life a farmer lives depends to an important extent upon his income from commercial farming.

Kinds of Local Studies Needed

It is dangerous to generalize regarding the opportunities for farming in the nation or in a state. The percentage of the rural-born population which can advantageously be absorbed locally varies widely from state to state and from community to community. If a community promises to have a deficit of agricultural workers, it is sound to prepare a high percentage of the farm-reared boys for these occupations. Only by local studies can we determine the number to be trained. These studies should take into account:

1. What has happened to former agricultural students.
2. The farm birth-rate and the numbers of farm boys in the elementary schools of the area.
3. The rate at which the management of farms in the community is turning over, the age at which farmers are retiring, and the average length of farming careers.
4. The tendencies regarding number of farms, size of farms, and number of farm operators and farm laborers required.
5. The opportunities in agricultural occupations other than farming which exist locally and in neighboring communities.

If registrations in vocational agriculture are reduced, provisions should be made without Federal aid for appropriate agricultural education for those who are eliminated from vocational classes and for others not now reached at all. All high-school pupils need guidance regarding agricultural occupations and farm life. Many are interested in agricultural avocations. All consume agricultural products. All are citizens concerned with the making of public agricultural policies.

But while we provide appropriate agricultural education for all high-school pupils, let us keep our Federal-vocational education funds for the purposes for which they were intended. They are all too limited for these purposes. To do this, we must select carefully, as members of our high-school classes in vocational agriculture, boys who probably will become farmers. We must not spend all of our vocational-agriculture funds upon boys of high-school age, but rather we should use those funds with great care and discrimination at the high-school level, leaving most of them for a more definite and functional kind of vocational education which can be provided thru part-time and evening classes.

Supervised Practice

H. H. GIBSON

Setting Up Successful Co-operative Projects

CHESTER LYBECHER, Teacher, Walla Walla, Washington

The Wa-Hi F. F. A. Swine Project

IN WALLA WALLA we are always up against the problem of the boy who lives on a small farm close to town and who has little money to carry on project work. In answer to this situation the F. F. A. chapter in 1932 bought one registered, bred Duroc Jersey gilt at a cost of $60. With this as a beginning, the chapter has let out gilts on contract to 42 boys, and in addition has sold 12 pigs and gilts for a total of $171.25.

The chapter now owns 11 gilts that are out on contract for the current year. The gilts are valued at a price of $25 each, or a total of $275.

At the end of four years we found it so hard to secure the type of boar we wanted that the chapter again came to the aid of the boys by buying one. Since that time we have had the best we could get in boars. We have had a grandson of New Era, who was the U. S. grand champion boar a few years ago. This year we are using the Son of Waveline from Doctor Bennett's herd in Illinois. The sire of the present boar recently sold for $1,500.

A boar house with three pens separated by panels was built to care for several sows at a time while waiting for service. Our boar has become so popular that we are forced to turn away prospective breeding. A nine-months old boar is being used this year. The boys are allowed the boar service at $1.75, a price just above cost.

This co-operative project has worked even better than was hoped for in the beginning, due to the following reasons:

1. The new pigs to be given out are ready one month after school starts, just in time to get a line on the new boys and to have them ready to take the pigs.
2. Once the pigs are taken out they need no more care than if they belonged to the boy.
3. The only cash output for the boy is the breeding fee and the registry fee.
4. It provides a very easy source of income for the chapter.
5. The quality of the Duroc swine has improved very greatly during the eight years this project has been in operation.
6. It makes a very fine group of projects for comparison of management problems.
7. Records are kept of the size of litters and other miscellaneous information which helps in the sale of the pigs.

Shown here is a copy of the contract we have used on this co-operative project.

There are some half dozen or more swine co-operatives in Washington patterned after the one in Walla Walla and all seem to be working very satisfactorily.

After eight years of use I have no changes to offer on this project. The only difficulty we have is to get all the gilts grown out in good condition.

The Wa-Hi F. F. A. Potato Co-operative

We are in a very favorable situation here for the production of certified seed potatoes. For some years I have considered this situation with the idea that it might be developed into a good type of project. Like the swine project, the potato co-operative was organized for two purposes: one, to make money for the chapter, and the other to provide projects for some boys. This is the second year we have used this type of project in Walla Walla and have met with considerable success.

Unlike the swine project, the boy must be able to put up his share of the money before he can become a member, and from the standpoint of supervision it is much more difficult than the swine type of project.

We were up against two problems very difficult to overcome. One was equipment with which to work the ground. The other was storage. The first was overcome by paying one-fourth crop rent to have the ground prepared for us to plant. Since planting for seed comes later than for commercial planting it was possible to get planting equipment. We plant the last half of the month of June. The second problem—storage—was solved by getting a cellar close to school. This is important if one is expecting to use classes for grading work.

The first year we had a poor crop due to the dry season and poor land, so we made no money, but lost none. This year we are going to do very well and the boys find themselves confronted with such problems as determining the price to charge for the different grades of seed. I must adhere to their price scale. Since the amount of money in this project runs into several hundred dollars the boys feel the weight of responsibility and shoulder it very well.

Accompanying is a copy of the potato contract. We are expecting each share, after paying its self labor, to still pay back $20 for the $10 put into it.

A REGISTERED-SWINE AGREEMENT

The WA-HI Bluedevil Chapter of Future Farmers of America, agrees to give to ..... one gilt eligible for registry and old enough to be bred for spring farrowing which will be the property of ..... after he has fulfilled the agreements below.

The WA-HI F. F. A. Chapter further agrees to furnish transportation for the gilt to ..... place, also from this place to the boar for service and back again, either by lending the trailer belonging to the chapter or the trailer and car as needed.

The WA-HI F. F. A. Chapter also further agrees to mark the animals to be returned to it by the tenth week after farrowing, so the owner may sell, or do as he sees fit with the rest.

The WA-HI F. F. A. Chapter agrees in the selection of its pigs to leave the owner of the sow one gilt.

I, ..., agree to take the gilt and to care for her and the pigs to be returned to the F. F. A. to the best of my ability and to fulfill the agreements below:

(1) To register the gilt.
(2) To breed her to a registered boar. The boar to be agreed upon by myself and the instructor of agriculture.
(3) To pay the costs of breeding and registering.
(4) To return to the Future Farmers of WA-HI a percentage of the first litter with the right of registry according to the following scale, on or before the first of October ..... as the Future Farmers wish. The count will be based on the number of live pigs at three days of age.
  (a) 10 pigs or over, return three to the F. F. A.
  (b) 5 to 9 pigs inclusive, return two to the F. F. A.
  (c) 3 to 4 pigs, return one to the F. F. A.
  (d) If less than three pigs, then the F. F. A. will not require a return until the following year. If on the second litter the sow farrows less than four, the F. F. A. will not require a pig to be returned.
(5) If the pig dies after selection from a preventable cause, before being delivered to the F. F. A., it shall be replaced with another pig satisfactory to the agriculture instructor or repaid in some other way satisfactory to the agriculture instructor.

Special Agreements: .....

.....

Signed this.....day of.....19.....

Boy

.....

Father

..... Pres. of F. F. A.

..... Agriculture Instructor

The Class Project as an Aid in Attaining the Goals of Vocational Agriculture

BURDETTE GRAHAM, Teacher,
Prairie City, Illinois

CLASS projects, those in which a class or classes take part in carrying out the necessary jobs or a part of them, are very effective in attaining the goals of a department of vocational agriculture. Some of the outstanding ways in which the class project may be valuable are:

1. The class project serves as a well-advertised demonstration of the activity with which it deals.
2. The boys have actual jobs to do, and must take definite responsibility in carrying the jobs to completion.
3. The farmers of the community see that many jobs are not as difficult as they had thought, and they become interested in carrying them out.
4. The boys, being definitely interested, observe the results of the project long after it is finished. They take great pride in having taken the lead in some new activity in the community.
5. Boys become interested and willing to attempt similar projects on their home farms. Having had experience, they do not hesitate to attempt ordinary jobs.
6. Interest in the activities of the department and the school is increased. One class project done well leads to the opportunity of doing many more.

Examples From Prairie City

The class projects we have used have pertained largely to those of an improvement nature. Some have been large and some small, the smaller ones sometimes being little more than a field trip or demonstration. The larger ones have included:

The landscaping of a farm home, including the grading of the lawn, making a landscape plan, ordering shrubs, setting out the shrubs, and co-operating with the Farm Bureau in carrying on a windbreak demonstration. This included the digging and balling in burlap of 75 Norway spruce, and setting them out.

The laying out of two contour demonstration fields and supervising the planting of these fields.

The wiring of a hog house according to R.E.A. regulations.

The laying out of pasture fertilizer plots to study the effects of top dressing.

The installing of a farm plumbing and sewage system, including the building of a septic tank according to theUniversity of Illinois specifications and the buying and installing of the plumbing equipment.

The drilling of a well for supplying water in carrying out swine sanitation.

The building of a brick chimney from the roof up.

The draining of a cellar, a tiling job.

Related Class Instruction

We did the work as a part of regular class work with certain boys in charge of various jobs, but shifted the boys enough so that all had some part in each job. Instruction and reading on each of the various jobs was done before attempting any of them. Following the completion of the jobs the boys were tested, in order that they would not neglect details, nor any jobs in which they were not particularly interested. This is very important as some boys would otherwise learn little, but only do as they were told.

We included all boys taking agriculture in these projects as we did not plan to repeat class projects more often than once each four years. It was felt that all boys in school should take part while the project was in progress. We believed that such projects were of enough value that time should be given to them at the expense of any of the jobs of other classes, except timely jobs concerning the class work.

How We Start

In getting such class projects started, considerable time is usually necessary to get the farmer interested enough to allow us to plan the job. In all of the above projects the fact that the class was willing to help carry out the job seemed to be the thing that made the farmer willing to attempt it. Suggesting to farmers the goals we were attempting to attain and taking them to visit similar jobs that had been done in the same or other communities was the most valuable means of getting the plan under way. The fact that a farmer's boy can use the project as an improvement project sometimes is an incentive to interest the farmer. One job done well by the boys is very helpful also in getting the farmers to attempt jobs. Giving the farmer much of the credit for the job, and letting it be known that he is doing a fine community service is also very important. Certainly, such a farmer does deserve much thanks.

We have found that it pays to offer the service of the department and the boys any time when a good opportunity arises. We plan with the farmer as to time, costs, and ways of doing the jobs. When possible we get him to allow the boys to help plan and to make estimates.

The Public Knows What Is Being Done

After a class project is finished it is important to keep in touch with the farmer to see that all is going as it should. We take boys and farmers of the community to visit the project, especially if the farmers or boys have similar problems on their own farms. New students should be taken to see the projects also. The school officials should be taken to visit some of these. Not all school officials need visit all the projects, but each one should visit some of the projects. If school officials agree with the departmental goals, they will surely agree that the class project is a very necessary and efficient teaching device, and that some of the goals could hardly be carried out in any other way. If the project is one near the road and the farmer is agreeable a marker should be placed explaining what is being done and that the farmer, his boy, and the agriculture department are co-operating in the project.

Such class projects tested in any way we might choose will reveal that they are very efficient in helping attain the goals of the department, and in addition add much in the form of departmental publicity and community interest. After all, the real measure of any education is the degree of change made in individuals. How better could change be made than by the individual himself? The class project does this.

WALLA WALLA CO-OPERATIVE SEED PROJECT AGREEMENT

Purpose: The purpose of this co-operative shall be to produce certified seed potatoes of the netted gem variety.

Membership: The membership of this co-operative shall be the boys taking vocational agriculture whose names appear at the bottom of this contract, and are members of the F. F. A. Chapter.

Finances: Shares of $10 each will be sold to the boys as needed by the F. F. A. Chapter. The shares are to be paid for as follows: one half on or before June 15 and one half on or before October 1.

Production of Potatoes: Land for this project is to be rented from Mr. Everett Meiners, approximately seven acres in amount, at a cost of one fourth.

Work on Project: At such times as work is necessary on the project each member shall report for work or furnish a substitute, or pay the cost of a man hired in his place. Self-labor shall be computed at 25c an hour.

Payment on Projects: The first payment made from money derived from sale of potatoes shall be for costs of production; second, for self-labor. The remaining amount will be divided equally among the shares.

Records: The agriculture instructor, or someone appointed by him, shall keep the daybook and furnish copies of the transactions to all the members. Each member shall be required, before receiving final payment, to turn in his project book complete.

Officers: This organization shall have the following officers: president, secretary, treasurer, and adviser. The president shall be responsible for contacting the members relative to work, shall preside at meetings, and shall cast a vote in case of ties. The secretary shall keep the records of the organization. The treasurer shall handle all moneys of the organization. The adviser shall assist wherever he is needed.

Meetings: Meetings shall be held at the call of the president or adviser.

Budget:				
	Seed: 55 sacks @ $1.50	$82.50	Planting, horse labor	$10.00
	Cold storage	6.00	Certification	15.00
	Sacks: 400 @ 4c	16.00	Trucking	30.00

Agreement: We, the undersigned, agree to the foregoing statements and do hereby fix our names after the number of shares we have pledged ourselves for purchase:

J. B. McCLELLAND **Farmer Classes** O. C. ADERHOLD

Planning Programs of Agricultural Education for Out-of-School Young Men and Adult Farmers*

R. W. GREGORY, Specialist in Part-Time and Evening Schools, U. S. Office of Education

R. W. Gregory

THE title of this paper is an indication of what has happened to our thinking concerning instruction for out-of-school groups. Formerly we were almost wholly concerned with "courses," "farm-job outlines," "winter schools," and "short courses" as we attempted to organize instruction for these groups. As we have come to see the futility of attempting to complete the training in the four high-school years, so have we sensed the inadequacy of the instruction for the out-of-school groups, limited, as it were, by the implications contained in expressions similar to those used above. Most of us are ready to see and to concede that a *program* of instruction, not just a "course," must be formulated.

A Continuing Program

This program of systematic instruction must be organized on a continuing basis. Not only must it operate on a year-around basis, but it must also be designed for growth and development thruout the years.

Even on this basis it is hardly conceivable that students will "get too much learning" for the difficulties of farming. Furthermore, many of the crucial issues facing farmers today are such that they cannot be solved in a short duration of time. If we learn thru solving, then the learning must be spread over a greater span of years. Likewise, intermittent periods in which there is no learning activity are periods of waste and lost opportunity and of actual recession, and should be avoided in a program of systematic instruction in vocational agriculture.

An Integrated Program

Any program of systematic instruction for out-of-school young men and adult farmers must be planned as an integrated part of a complete and comprehensive long-time program of vocational education in agriculture for the whole farm population. It must be a co-ordinate part of such a program, so interwoven as to present neither obstacles to nor a break in the continuity of a unified educational service. Altho each phase of this whole program must take into account the differentiating characteristics of each group, all phases must finally provide a unified approach to the whole problem of farmer education. The program must take cognizance of what has been taught in previous programs of instruction and it must be organized on the assumption that future programs will be developed. At the same time, this program must also be sensitive to the needs arising out of current problems of farming and farm living.

Placement and Progressive Establishment

These programs must be geared to and synchronized with the specific vocational objectives of placement and progressive establishment in farming. They must have as central in their purpose the making of every element in the program contribute specifically to the attainment of these objectives. Not only must the program provide for the discovery and classification of occupational opportunities in farming, but it must also implement the getting together of whatever it is that one must have with which to get into farming, as well as to improve oneself progressively in it.

A Comprehensive Program

It must recognize that farming is not only a business but a way of living. The program of systematic instruction should, therefore, be made up of a wide variety of educational activities. It should be clearly understood that while we recognize the strategic and basic significance of the economic in farming, we also sense the importance and worth of many intangibles that may be had thru enriched farm living. In the end these intangible values will materialize largely to the extent that young men and adult farmers appreciate their significance and know how to develop them.

A Student-centered Program

The program should be of such a nature that it becomes increasingly possible for those enrolled to take over gradually its direction and control so that in the end it becomes self-perpetuating and is largely independent of the personality of any given teacher. Education, above all things, should make it increasingly possible for individuals and groups to be able to solve their own problems, work out their own programs and "stand on their own feet." From the very beginning, out-of-school young men and adult farmers should be given some responsibility for the development of both the content and procedure of the instructional program. Definite organization techniques should be planned and developed to facilitate this taking place.

A Public Education Program

If final results are to be attained commensurate at all with the needs of the individuals being served, the local public school authorities must support the program with all of the school resources at their command. The program as it is developing is altogether too comprehensive and important for one individual teacher to operate alone. If we are to expect a real program to take the place of our abbreviated 10- to 15-week unit courses of class teaching, the day of the one-man show will have to be brought to a close and a variety of educational resources brought to the program's support. If this is to happen, school administrators as well as teachers of vocational agriculture must be given an opportunity to grow in their conception of the responsibilities and opportunities for a complete program of vocational agriculture.

An Action Program

Farming is productive, and any educational program designed for vocational outcomes must end in farming activity. This imposes upon us the necessity for "deeds as well as words." Education thru doing must lead to an improvement in the doing, else its cost and value may be questioned. This necessitates the building of the program of instruction around farming activities, farming both as a business and as a way of life. Farming is not static; hence, a thing learned today does not necessarily stay learned for tomorrow. This program of education must not be built around current farming activities alone, but it must also take cognizance of the value of recurring activities. It becomes, as it were, a process set in motion, a never-ending growth.

A Planned Program

If a program of agricultural education such as we have been discussing is to function effectively, it must be carefully planned and systematically organized. As a matter of fact, unless such planning and organizing takes place, what we do is likely to become a heterogeneous series of unrelated activities having little integration or relation one to another. Planning a program does not necessarily mean taking out of it the place in its development for individual pupil initiative and responsibility, nor does it imply that by virtue of being planned it becomes rigidly academic in form and function. Rather it means a systematic, orderly approach to the solution of a problem that has to be solved, a technique of approach that guarantees a progressively sound solution. The program must be as a planned campaign in the interest of farming and farm people.

Guiding Principles

There are a few guiding principles which may be of considerable service to us as we attempt this organization.

In the first place, the program as a whole should be made up of a series of well-organized and clear-cut units of educational activity. Those units should be concise, specific, and well integrated. There never should be any question in the mind of the teacher or pupil as to their intent or purpose.

In the second place, such units as appear in the completed program may, and probably should be of varying length, intensity, and frequency. It must be remembered that we are now dealing educationally with individuals who are not primarily full-time students but who are, for the most part, engaged full-time in an occupation. This means that they are workers first and students second, and that anything planned for them educationally must be planned in the light of these facts.

Third, the units of instruction must make provision for, or be contingent upon an increasingly enriched pupil experience. Inasmuch as these students are primarily concerned with the problems of an occupation and largely the work problems at that, it becomes quite important, if we would really teach on a vocational basis, to make our units of instruction function thru such work experiences as they are having naturally and normally; or, if those are not available, make provision for productive activity that will insure them.

Finally, each unit of instruction offered should be selected and organized appropriately to some occupational need. It should be such that a direct contribution is made to the assets needed by the pupil with which he will solve his problem of farming or farm living. This implies a clear understanding on the part of both teacher and pupil as to what is needed as they jointly plan for and organize courses of vocational instruction.

In the main, the details of content in the various courses offered will be of four types. These should come to the learner thru the following:

1. A selected list of recommended and approved practices from which the learner may select ones deemed most appropriate to his conditions for adoption and adaptation.
2. A wealth of first-hand information gathered largely thru observation and demonstration. Such content the student goes after, and gathers unto himself such quantities and kinds as he can absorb.
3. An adequate supply of valid experimental evidence needs to be available and presented so as to "work out" the undue effects of bias, personal prejudice, and invalidated and opinionated judgment.
4. There is a need always for evidence as to what has been the local experience with respect to the handling of the problems under consideration, because, in the last analysis, the test is in the "functioning locally."

We will make progress largely as we are able to (1) plan programs of instruction that (2) are made up of a series of well-organized, integrated units of instruction, (3) that are based upon valid, authoritative functioning content, designed specifically to make objective, concrete contributions to the attainment of specific objectives of placement and progressive establishment in farming.

Opportunities in Farming and Related Occupations: How They May Be Discovered, Evaluated, and Appropriated by Young Men*

JAMES H. HATCH, Assistant State Supervisor,
Buffalo, New York

A PRINCIPLE which is now becoming widely accepted is that the vocational objectives of placement and progressive establishment in farming are the center about which the whole program of instruction for out-of-school youth and adult farmers should center. These objectives involve the discovery of opportunities, the classification and evaluation of opportunities, and, moreover, the attainment of such resources as are necessary for individuals to take advantage of those opportunities that are found to be appropriate to their progressive establishment in farming occupations.

Three important problems to be considered here are: (1) How can opportunities be discovered? (2) How can opportunities that are discovered be evaluated? and (3) In what ways can individuals be assisted in their preparation to take advantage of the opportunities that have been found to be appropriate to their progressive establishment in farming?

The discovery of opportunities is basic to any program designed to attain the objectives of placement and progressive establishment in farming. It is probable that our progress will depend upon our ability to discover these opportunities. The forward progress of this basic effort depends upon: (1) our ability to delegate the responsibility for such discovery and (2) the development of usable techniques and methods of discovery. It is appropriate that we should inquire at this point as to who should do this job. Who is available to go out and discover opportunities? Obviously the answer to this question will depend upon the unit or area we select in which to make our discoveries.

Surveying the Local Community

It is my belief that the logical unit in which to discover opportunities is the patronage areas of local schools in which teachers of agriculture are employed. In turn, the logical persons to carry on a program of discovery in these local communities is the local teacher of agriculture, assisted by organized groups of out-of-school youth and adult farmers in the local area. Surveys of opportunities can be integrated with surveys of the human and agricultural resources of a given area. Such surveys should be as comprehensive as time and money will permit. It is evident that the local teacher is most strategically located, not only for making such surveys, but also for evaluating the opportunities so discovered and assisting the farm youth in the area to prepare themselves to take advantage of them.

The second problem of discovery pertains to the techniques and methods to be used. It is probable that some type of survey form can be used most advantageously in this regard. Several major criteria may be cited as guides for the formulation of such a survey form. Among these are:

(1) The form should be organized to discover the several types of placement opportunities.

(2) The form should take cognizance of potential opportunities and future opportunities as well as those immediately available.

(3) Forms should be so organized as to provide sufficient data for an evaluation of the opportunities discovered relative to specific measures of the farm, the farm business, the home conditions, and family and social relationships.

It seems clear that little progress can be made in discovering opportunities until teachers and general school authorities are encouraged, urged, and expected to sponsor and effect surveys to discover specific opportunities on specific farms in the patronage areas of local school communities.

Evaluating Opportunities

The discovery of opportunities is, however, only preliminary to the vital problem of evaluation to determine the appropriateness of specific opportunities to the needs of individual young men or adults. Jobs for hired men, opportunities for sons to form partnership agreements with fathers, tenant opportunities, and farms for sale can be found at any level on any evaluation scale that may be devised. Likewise, the needs of young men and adults for experience, training, and material resources vary almost in proportion to the number of such individuals in an area. The problem in all its complexity appears to be to evaluate opportunities in terms of the needs of the individuals who are available to take advantage of them. This, of necessity, involves not only an evaluation of the opportunities, but also an evaluation of the individuals. In any event, opportunities should provide for a growth in farm experience, resources, and abundant living for the individuals who take advantage of them.

Opportunities may be evaluated and classified into many types and categories. Time and energy to carry these out are limiting factors in this regard. Suggested classifications based on evaluation include those based on (1) time of availability, (2) type of opportunity (step on agricultural ladder), (3) appropriateness to needs of available individuals, (4) the business organization of the given farm situation, and (5) the relative desirability of the opportunity from a "way-of-life" point of view.

It is evident from a study of these problems that an evaluation of opportunities is fully as important as the fact of discovery. A functioning program planned to promote the placement and progressive establishment of out-of-

(Continued on page 155)

*This paper was presented at the 1940 North Atlantic Agricultural Education Conference.

L. B. POLLOM

Farm Mechanics

Teaching the Use of the Farm Level in the Farm-Mechanics Course

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Tempe, Arizona

I. F. Nichols

FARMING is directly concerned with the conservation of our natural resources. Not only do we as a farming nation need to realize the importance of soil conservation and, in arid sections, the conservation of water, but also we need to realize that in this highly competitive age it is necessary to secure as high yields and quality as is possible with the least expenditure. In many sections the use of a farm level is an indispensable aid in the attainment of this goal.

It is hard to conceive of a high yield of corn on an irrigated field where the lower one third has been killed out by the puddling of irrigation water, where the upper one third is short and scrawny due to lack of moisture penetration, and the remaining one third is a moderate stand and produces a fair yield. Yet we have many such fields in almost every irrigated section. The seed cost for this type of field is identical with that of a good healthy stand, the expense of planting is the same, cultivation costs are the same, and about the same amount of water has been used on both. The only difference in expense would be for additional labor to harvest the higher yield on the field where better irrigation management had been used.

There are many examples of such economic wastes. Something needs to be done about this problem. Why not start with the boys who are taking vocational agriculture in our high schools?

Difficult Work to Teach

The use of a farm level is perhaps a difficult unit to teach but its results are worth the effort. After five years of experience the following teaching plan has been set up and used successfully by the writer. Progress depends upon the general ability of the class. Experience has shown the writer that it is useless to proceed to a new unit until the section at hand is thoroly understood by a majority of the class.

The following three units are usually taught in Agriculture I and more advanced units are presented in Agriculture II and III. Advanced units take up such things as mapping a field and posting elevations, plans for leveling land, running borders on contours, and other uses of the level.

FARM LEVEL TEACHING UNITS FOR AGRICULTURE I

INTRODUCTION—WHY LEARN TO USE A FARM LEVEL

A. *Materials and supplies*: farm level, tripod, reading rod, notebook.
B. *Need for, and importance of the farm level.*
   1. Conservation of land and water.
      a. To know which way the land should be laid out for best irrigation practice.
      b. To adapt the fall of the land to the soil type so as to secure uniform penetration.
      c. To prevent washing and erosion of land due to too much fall.
      d. To prevent puddling of water at lower end or waste by water running into road.
   2. Securing better yields with less water.
      a. Insures a uniform crop because of uniform penetration.
      b. Crops are not killed out on lower end by puddling and consequent cooking of the crop in the summer sun.
      c. Land can be leveled to accommodate most types of soils, thus obtaining good yields on most fields.
   3. Other uses of the farm level.
      a. To aid in laying out fence lines and turning square corners.
      b. To lay concrete pipe lines with the proper fall.
      c. To lay out foundations for buildings.

Unit I—Parts of the Instrument, and Setting and Adjusting

A. *To learn the parts of the instrument and their use.*
   1. Tripod: legs of the tripod, instrument plate on tripod, and instrument fastener on tripod.
   2. Reading rod: discussion of scale used on rod, reading disc and its use, and use of extension on rod.
   3. The instrument: adjustment screws, telescope barrel, eye piece for adjusting focus, cross hairs in barrel of telescope, level and bubble, and the quadrant.
B. *Setting the instrument.*
   1. Fasten the instrument securely to the tripod.
   2. Placing the tripod.
      a. Place tripod at proper height so instrument man can take readings with greatest ease or greatest number of readings.
      b. Plant legs of tripod firmly, pressing each one into soil so instrument will be firm.
      c. Be sure instrument plate on tripod is as level as possible.
      d. Care in working around tripod: do not step near, lean on, nor bump legs.
C. *Leveling the instrument.*
   1. See that all adjustment screws are snug against instrument plate on tripod and be sure that they remain so thruout use of instrument.
   2. Place barrel of instrument directly over two adjustment screws and, using thumb and first finger, turn screws until the bubble is in the center of the level. Keep screws snug by turning each one the same, only in opposite directions as suggested. If they become loose turn one only until they are again snug.
   3. Rotate instrument until the barrel is directly over the two remaining screws and level as described in "b" part.
   4. Return barrel over first two adjustment screws and level carefully as before and repeat over the other two screws for the second time. Repeat this operation until level bubble remains in the center regardless of which way the instrument is turned.
   5. As a final check place barrel over two adjustment screws and rotate 180 degrees, or half way around and check for level. Repeat this over the other screws. The instrument must be level for accurate readings.
D. *Require each member of class to set the tripod and level the instrument as many times as is necessary for him to do a good job without help from any source.*

Unit II—Taking Readings and Finding Difference of Elevation Between Two Points

A. *Signals to be used in taking readings.*
   1. Signals to denote that disc be moved up.
      a. To signal for a disc to be moved up a long way hold right hand high above shoulder, arm straight, palm of hand up.
      b. To signal for small movements of disc up, same as above, except hand just slightly above shoulder level.
   2. Signals to denote that disc be moved down.
      a. To signal for a disc to be moved down a long way hold right hand far below shoulder level, arm extended and palm of hand down.
      b. For small movement of disc down same as above except hand is just slightly below shoulder level.

Instructional Planning in Farm Mechanics

V. J. MORFORD,
Supervising Teacher in Agriculture,
Seward, Nebraska

IN CHECKING thru one of our well-recognized shop texts I find this statement, "Most shop teaching is at present of inferior quality." If this is the true condition of our shop teaching it is time that we do something about it. I believe in too many shops very little real teaching is being done.

Each year as we get a new class of students we find the boys have many things to learn and almost as many to unlearn. This learning process is not best accomplished by turning the boy loose in the shop to start the construction of a project without sufficient training. Our shop programs for each year of shop work should be as carefully planned as any other work in vocational agriculture.

IN TEACHING mechanical work we can group the work done under enterprise headings in much the same manner as in livestock and crops production. Jobs in farm mechanics are managerial and operative. The managerial jobs have to do with the planning, selection, and purchase of materials while the operative jobs include building, overhauling, and construction. It is not necessary to make a fine distinction between the two in teaching, but certainly we should not omit the managerial part of our shop teaching.

Importance of Managerial Jobs

All are aware of the operative jobs but many times teachers overlook the managerial jobs. Some of these are often more important than the actual construction jobs.

For example, the experience of selecting the correct kind of lumber in building a hog house can be very valuable. Here the boy decides whether he should buy shiplap, dropsiding, or stock boards. In his decision he will be led to consider the qualities and the cost of each. He will also decide whether this lumber should be fir, white pine, or yellow pine, and in doing so will learn the characteristics and identifying features of each kind of wood.

The same kind of experience can be gained in the selection of hardware. Here again we have the opportunity to present special types of hardware. Sometimes this hardware is seldom used but has definite qualities as toggle bolts, sheet-metal screws, expansion shields, etc. A rather long list of similar managerial problems might be discussed as they relate to concrete work, farm machinery, rope work, window repair, sheet-metal work, etc.

Study Is Important, Too

Just how and when this teaching should be done might vary in different schools. I have found that a carefully selected shop library in the high-school study hall, with definite class assignments in these references has made it possible to cover a great many shop problems with a limited amount of time. These assignments are discussed in the classroom, where we have tables and blackboard, before the class goes to the shop. Here special reports and demonstrations are often given. Identification of woods, nails, screws, and miscellaneous hardware is easily handled in the classroom. Here is also a good place to figure bills of materials and do rope and belt work with the entire class doing the same type of work.

When assignments and special problems are being discussed it is usually not necessary to spend more than 30 minutes in the classroom. While these classroom activities do not take the place of shop demonstrations and particular job instruction, it does save the instructor considerable shop time in that he does not have so many individual problems to meet. There is never any lagging in interest if the problems are real and discussion is not carried on over too long a period.

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3. To signal that reading has been taken cross both hands over the head several times.
4. To straighten vertical position of rod hold right hand in vertical position in front of face and then lean hand in direction rod is to be leaned.

B. *Taking readings.*
1. The instrument man.
   a. Locate rod man, point instrument toward rod man, sight thru instrument and adjust eye piece so that rod is clear and distinct.
   b. Signal rod man to move disc until cross-hairs of instrument coincide with cross on disc.
   c. Check level of instrument before and after taking reading.
2. The rod man.
   a. Place rod on a representative spot in the vicinity of the reading, not in hole or on a bump.
   b. Hold rod steady and in a vertical position, taking care that it does not lean to either side, or backward or forward.
   c. In moving disc make movement as slowly and easily as possible. Do not jump or jerk the movements.
   d. Observe closely and carry out to the best of your ability all signals given by the instrument man.
   e. Do not read the rod until instrument man has checked the level of his instrument and signaled so.
   f. Read the rod accurately to the nearest quarter inch.

C. *Determining difference of elevation of two points.*
1. If the instrument has been properly set and leveled, when one looks thru the telescope his line of sight casts a line that is level regardless of the rise or fall of the land. Thus, wherever line of sight cuts the rod, that figure will be called a rod reading. If rod readings are taken on two different points, the difference in elevation of these two points can be obtained by simple subtraction. This is known as differential leveling.
2. In differential leveling as the contour of the land rises the numerical value of the rod reading will be smaller; and conversely as the land lowers the rod reading will be higher, numerically. Thus, station A with a rod reading of 2′5″ would be higher than station B with a rod reading of 3′4″.
3. To secure difference of elevation between two points, stations A and B, take a rod reading on station A, then move over to station B and take a reading on that point. By subtracting the lower figure from the higher figure the difference in elevation between the two points is obtained.

D. *Provide opportunity for every member in the class to take several readings* of this type and see that each boy has a chance to be instrument man and rod man. Every member of the class should figure the difference in elevation for each two points taken.

E. *Review and test on materials presented* in units I and II. Be sure to clear up misunderstandings brought out in the practice or review work.

Unit III—Keeping Notes on a Series of Readings in Differential Leveling

A. *To learn the definition and meaning of terms used in keeping a set of notes on differential leveling.*
1. *Bench Mark*, hereafter known as B.M. is a permanent point on which the first reading is taken. In farm level work the B.M. is always given an elevation, usually 100′, and all other readings are calculated with reference to the B.M.
2. *Back Sight*, hereafter known as B.S., is always the first rod reading taken after setting and leveling the instrument.
3. *Height of Instrument*, hereafter known as H.I. refers to the elevation of the instrument with reference to the given elevation of B.M. The H.I. is always obtained by adding the B.S. reading to the elevation of the station on which the B.S. reading was taken.
4. *Fore Sight*, hereafter known as F.S., refers to all rod readings taken on stations after the B.S. reading has been secured, and until it is again necessary to move the instrument.
5. *Elevation*, hereafter known as Elev., refers to the elevation in feet and inches of any given station with reference to the B.M. The elevation of any given station is obtained by substracting the F.S. rod reading taken on that station from the H.I. which has already been determined.
6. *Turning Point*, hereafter known as T.P., refers to the last station on which an F.S. will be taken before moving the instrument to a new location. The F.S. reading determines the elevation of that particular station.
7. *Station*, hereafter known as Sta., refers to any point on which a rod reading is taken.

(Continued on page 158)

Studies and Investigations

C. S. ANDERSON

Approved Practices for Projects in Vocational Agriculture

GLENN O. BRESSLER, Teacher,
Hollidaysburg, Pennsylvania

TEACHERS of vocational agriculture quite generally feel a need for an outline or guide which would be useful to their pupils in planning home projects, and for a device which they might use to make their project visits more purposeful and educational.

G. O. Bressler

With this need in mind, lists of approved practices for 17 major types of vocational projects were prepared. An approved practice is simply a satisfactory method of doing a farm job and does not imply that it is the only method or procedure which can be used in a particular situation.

In preparing a list of approved practices, the writer determined the important jobs to be taught, and arranged the jobs in the order in which they occur in conducting a home project. For example, the approved practices in managing a baby-beef project include the jobs of securing stock, housing, feeding, preventing and controlling diseases and parasites, fitting and showing, and marketing. In the accompanying illustration these appear as the major headings and are arranged in logical sequence. The jobs form a complete cycle of fundamental operations in conducting a baby-beef project.

In order to arrive at the approved practices for each of these jobs, the most recent bulletins, circulars, and reference books on agricultural research were reviewed. The practices which a boy could reasonably be expected to adopt in his home project were then listed.

After a list of practices for a particular project was formulated, extension and subject-matter specialists were consulted and the lists were revised. The process was repeated for each enterprise.

In this study approved-practice lists were prepared for baby-beef production, sheep breeding, sheep fattening, swine breeding, swine fattening, baby-chick projects, laying-hen projects, dairying, vegetable growing, small-fruit projects, corn production, potato growing, small-grain projects, and beekeeping.

A portion of the list of approved practices set up for managing a baby-beef project will serve to illustrate.

Recommendations for Use

The approved-practice lists can be used in four major ways; first, as a partial course of study; second, as an aid in planning projects; third, as a guide for checking completeness and accuracy of plans; and fourth, as a checklist for more purposeful project visitation and supervision.

All jobs found in the lists of approved practices should be included in the course of study and be taught at a time when the pupil will benefit most by the instruction. This means that first-year project jobs should be taught in the freshman year, second-year project jobs in the sophomore year and so on. Jobs should be arranged according to seasonal problems in the farming program. The pupil's own problems, as they relate to his projects, should be a basis for teaching.

An Aid in Planning Projects

The lists of approved practices should definitely aid pupils in writing project plans. First of all, if the jobs suggested in the approved-practice list are included in the course of study, the pupil will receive classroom instruction in all phases of his project. By keeping a complete set of notes or decisions concerning each job he will then have material which will be helpful in planning his productive project.

When writing project plans it is suggested that the pupil be given a list of approved practices for his particular project to serve as a guide. He may start at the head of the list of practices, which in most cases has to do with the selection and source of stock or seed, and make written explanations in the form of plans as to how he expects to carry out and develop his project. Having completed this he may continue thru the list of jobs step by step, referring to the decisions in his notebook, until he has carried the project to completion.

APPROVED PRACTICES IN MANAGING A BABY-BEEF PROJECT.

APPROVED PRACTICES	TEACHER'S RECORD: Plan	Date of Visit			
I. *Securing Stock*					
a. Quality of breeding					
1. Select a purebred or a high grade beef calf with strong feeding qualities....					
2. Select a calf with good depth of body, well sprung in the forerib, and wide in the chest.....					
3. Select a calf with a clean prominent eye, indicating health and vigor.....					
4. Select a calf that shows natural fleshing over the back and loin.....					
5. Select a calf weighing between 350 and 400 pounds.....					
II. *Housing*					
a. Type of shelter					
1. Provide a box stall in the barn separate from the dairy herd, or in an open shed that is dry and free from draughts but has ample ventilation thruout summer and winter.....					
III. *Feeding*					
a. Growing and fattening					
1. Start with two pounds of grain per day plus plenty of hay. A suitable grain ration for the first month consists of the following:					
40 pounds whole oats					
30 pounds corn (cracked or coarsely ground).....					
20 pounds wheat bran					
10 pounds linseed oil meal (pea size)					

*Only a portion of the approved practices in feeding are given here. Six major jobs are given in the complete list.

A Guide for Checking Completeness and Accuracy of Plans

Unless plans are systematic and accurate they will prove worthless to the pupil in conducting his project. Plans are not merely one of the necessary evils in the project program, but are the basis of successful project work. Plans are an indicator of how well the pupil has analyzed the jobs to be performed during the course of the project. Plans reveal the pupil's interest as well as his understanding of the project. It is necessary therefore, that the teacher be sure that all plans are accurate, systematic, and complete. It is only logical that the teacher should use the same list of approved practices as a checklist of what he might reasonably expect from the pupil inasmuch as the pupil uses the approved practice list as a guide in writing his plans.

It is recommended that a form, similar to the one shown in the illustrations, be included as a part of the project-record book and used by the teacher as a checklist. The teacher may read the plan written by the pupil and place a check (√) in the column designated "plans" after all the practices the pupil has planned to adopt and incorporate into his project plan.

An Aid to Purposeful Project Visitation

Plans mean little unless they are carried out. It is for this reason that the teacher of agriculture is assigned the duty of visiting boys and their projects.

It would be ideal to visit each boy at the times new practices are started, or whenever a teaching situation develops. This, of course, is not always possible. Visitation, however, must be purposeful and not be of a "telescopic nature," or that of merely a "call," to the farm. Project visits must be timely and centered around a definite need for supervision and instruction.

Again, the lists of approved practices can be an aid to more purposeful project visitation by keeping the teacher informed as to what the pupil has done and what he needs to do in the future. This can be accomplished by checking each practice as it is carried out, using symbols such as (E) excellent, (G) good, (F) fair, and (P) poor, at the time of visitation. The teacher can very easily determine how closely the pupil is following his proposed plan by merely referring to the check marks in the column headed "plans."

In addition to the pupil using the lists of approved practices for his project, the teacher should have a similar list for each project that is under his supervision. These plans should be kept in a special notebook, and studied prior to making a visit in order to have a clear mental picture of what is to be taught in connection with the visit.

Such a system of checking plans and practices will undoubtedly bring about real improvement in any supervised farm practice program as well as in the classroom instruction.

New Bulletin on Occupational Information and Guidance

Occupational Information and Guidance: Organization and Administration is the name of the first bulletin issued by the new service in the Vocational Division, United States Office of Education, devoted to occupational information and guidance. The bulletin is written by Harry A. Jager, Chief, Layton S. Hawkins, formerly consultant in the service, and G. M. Ruch, present consultant in that service.

Principles and policies of vocational guidance are set forth as well as practices which will be helpful in setting up local and state programs of occupational information and guidance. State programs of occupational information and guidance are described, as well as certain city systems.

A study by William C. Reavis of the University of Chicago, which throws considerable light on current practice, is included.

The appendix contains the announcement made by Dr. J. W. Studebaker in October, 1938, the amendments to the policies bulletin (Vocational Education Bulletin No. 1, Revised), principles and policies which will govern the work of the service, and form for a state plan for setting up a state program of occupational information and guidance.

Opportunities in Farming

(Continued from page 151)

school youth will progress to a degree commensurate with the effort made to evaluate and analyze the opportunities in farming and the needs of youth and adults for placement and progress.

The ultimate in a program of placement is reached when individuals are assisted to find successive employment in situations that contribute to their growth and progress toward a farming status that may be considered for them to be optimum. A planned program of group instruction for out-of-school youth and adults can do much to assist in the preparation of youth thru the teaching of principles of sound credit, encouraging co-operative effort in collecting and filing information relative to opportunities, and in the purchase and maintenance of farm equipment. A study of standards for which to look in the several types-of-farming opportunities must also be incorporated into the program of instruction. Case studies of opportunities and needs should be appropriate for consideration by groups of young men and adults.

In Summary

It is probable that teachers of agriculture are best situated to survey specific opportunities for the placement and progressive establishment of youth in farming. Opportunities discovered must be evaluated and classified in terms of the needs of youth for farm experience, training, material resources, and home and social life. Obviously, a functioning program of instruction for out-of-school youth and adults must center about the problems involved in the growth and progress of individuals toward an optimum status in farming. Programs of instruction geared to this end will show progress as soon as complete, accurate, and comprehensive information is obtained concerning opportunities. This information must then be fitted and utilized as the keystone in the arch forming a planned program of group instruction to bridge the gap from adolescent exploration to the eventual permanent establishment of mature young adults on farms and in farm homes.

*This paper was presented at the 1940 North Atlantic Regional Conference of workers in agricultural education.

Book Reviews

American Farming-Agriculture II, by Andrew Boss, Harold K. Wilson, and William E. Petersen, edited by A. M. Field, pp. 509, illustrated, published by Webb Book Publishing Co., Saint Paul, Minnesota, price $3.50. Agriculture II, the second in the American Farming series, is presented from the vocational viewpoint. The subject matter is presented in such a manner that it will permit the students to experience and to develop their study in the natural order in which the problems of farm organization would be met by one who successfully follows the vocation of farming. The processes of organizing a farm business and learning the growth habits and behavior of the crops and animals commonly used in farming are given emphasis. Attention is given to the matters of operation only as they influence the effectiveness of the organization. The farm-as-a-whole approach to the study of agriculture is used, and the text should serve as a convenient aid in identifying significant problems and in the selection of content and activities suitable to the individual interests and purposes of the student. Questions and suggestive activities follow each chapter.—A.P.D.

Conservation in the United States, by A. F. Gustafson, C. H. Guise, H. Ries, and W. J. Hamilton, Jr., 445 pages, illustrated. Published by Comstock Publishing Company, Inc., Cornell Heights, Ithaca, New York, price $3. A non-technical presentation for the purpose of acquainting students and other interested readers with important facts concerning the conservation of natural resources in the United States. The book is divided into four general parts. Part I deals with the Conservation of Soil and Water Resources; Part II deals with Conservation of Forests, Parks, and Grazing Lands; Part III is concerned with the Conservation of Wild Life; and Part IV is devoted to Conservation of Mineral Resources. The introduction gives a history of the conservation movement and the men active in it.—A.P.D.

Shadow Over Winding Ranch, by Sarah Lindsay Schmidt, Random House, New York, price $2. The story is of a student of vocational agriculture and F. F. A. member who, with the co-operation of his younger brother and his devoted sister, sets about to restore Winding Ranch to fruitfulness and prosperity. The scene of the story is in Colorado. The book is intensely interesting from start to finish and does a splendid job of presenting the picture of vocational agriculture and the F. F. A. Especially recommended for F. F. A. members and their advisers.—A.P.D.

Future Farmers of America

L. R. HUMPHERYS

Thirteenth National Convention

The opening session of the Thirteenth National Convention of the Future Farmers of America, held at Kansas City, Mo., November 9–16, 1940. Seated on the stage is President Ivan Kindschi. At the lower left the Minnesota official F. F. A. band. Seated behind the delegates and national officers are American Farmers-elect, members of judging teams, local advisers, and visiting F. F. A. members

Gold Emblem Winners in the National Chapter Contest*

CHAPTERS entered in the National Chapter Contest this year were awarded gold, silver, and bronze emblems based upon their rating, rather than ranked, as in previous years. Four chapters were winners of the gold emblem. Excerpts of their programs as released by the U. S. Office of Education are given below.—*Editor.*

Ponca City, Oklahoma

Ponca City is in the strip of land opened to the rush of homesteaders in 1893. Until oil was struck in the county, farming was on a substantial basis but with the advent of drilling and high grain prices of war times, soil fertility was heavily depleted, according to the chapter report.

Among the practices which have been encouraged or introduced by Ponca City Future Farmers to bring the farming income up to a high level are the following: contouring land; selecting seed; controlling weeds, insects, and rodents; developing vines and small fruits; and repairing farm gates and buildings.

A dairy co-operative bull project was established, using Jersey, Guernsey, and Ayrshire sires, the latter purchased by the chapter. Every boy in the chapter planted some kind of temporary or permanent pasture for his livestock, single-variety poultry enterprises were introduced and also good beef breeding stock. Pasture rotation was practiced on sheep farms to control diseases.

The chapter promoted butterfat testing of all cows belonging to members and their parents and other adults. Co-operative livestock insurance was established by the Future Farmers, and feed was purchased co-operatively. A feed grinder was purchased and operated by the group as a means of reducing livestock feeding expenses. Community agricultural programs were planned and presented in five districts around Ponca City during the year, and boys helped farmers find high-quality dairy breeding stock.

Clarendon, Texas

In addition to an extensive layout of productive projects, the chapter has given much attention to improvement projects. Each member is engaged in organized soil and water conservation and in buying, selling, or showing co-operatively, while 90 percent are active in wildlife conservation. Both purebred and fat hogs were marketed co-operatively, and feed, medicine, and other items were purchased co-operatively. Educational booths were prepared for the tri-state and state fairs and for the state convention.

The chapter sponsors three registered Jersey bull rings and six registered boar circles. Broilers were raised co-operatively to serve at the father-son banquet. A summer tour was taken by 25 chapter members. A trust organization for supplying credit to members has been organized with a $4,000 capital stock, to be loaned at 4½ percent interest. As special community service many activities were sponsored, such as poultry shows, tree planting, dairy and pig shows, beautification of the school grounds and city park, Christmas baskets for the needy, pest control, pasture improvement, and Red Cross campaign.

Deer Lodge, Montana

Besides many outstanding individual project programs, the chapter has carried on numerous worth-while co-operative activities. The chapter pooled orders for chick starter and egg mash,

promoted a chick pool, purchased gilts for rotating projects, worked with other chapters in selling sheep and buying seed potatoes, and raised chickens for parent-son banquets. The chapter owns two battery brooders and brooded 2,600 chicks. The chapter initiated the formation of a weed control district and planted the lawns and shrubs around the school building.

In the field of community service, the members of the chapter helped farmers with such jobs as dehorning cattle, worming pigs, culling and caponizing poultry, and slaughtering hogs. They mixed and supplied 17 farmers with grasshopper poison and distributed 4,700 pounds of gopher poison. They helped rid the cemetery of pests. The boys sponsored a local junior fair and helped in its management. Many other services were rendered to the community toward the betterment of farms and town alike.

The chapter carried on many activities to develop leadership, including contests, special training, and awards. Thrift and savings were stimulated with the result that the savings per member average $65 and the average investment in farming is $190. The chapter itself has a balance of $351 cash in the bank. Scholarship was promoted by offering prizes for high-school marks. The recreational and social program includes picnics, basketball and other sports, orchestra, camping, parties, dramatics, and hiking.

Stephens City, Virginia

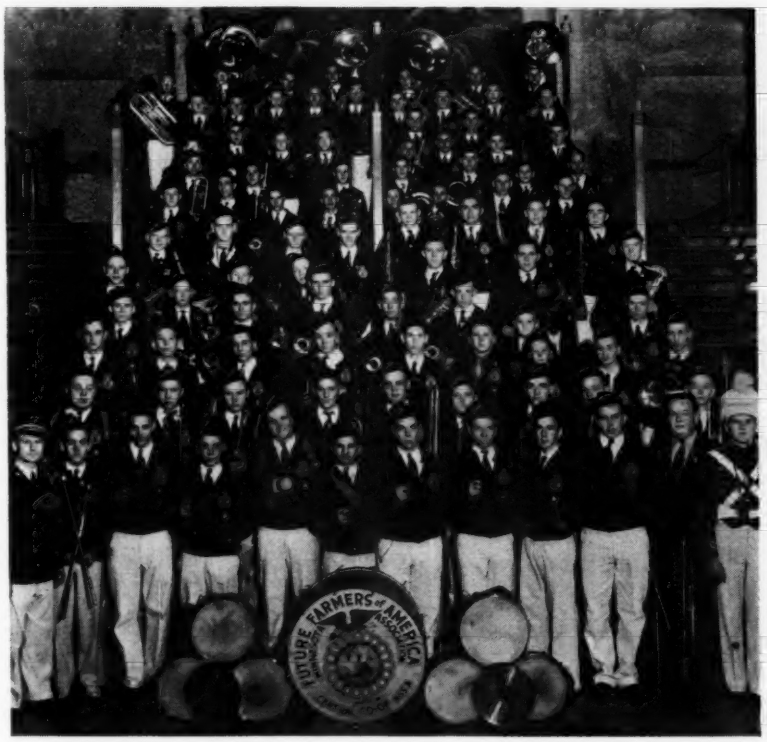
In addition to the excellent long-time supervised practice programs of its members, the chapter sponsored co-operative activities such as landscaping the school grounds; buying certified seed potatoes, fertilizer, seed corn, and onion and cabbage plants; a judging contest for the district F. F. A. federation of 15 chapters; selling wildlife stamps, and providing cover and feed for game birds. In the area of community service members of the chapter culled 1,280 chickens, tested 108 milk samples and 360 seed-corn samples, collected and distributed food and clothing for needy families, tested soil for 37 farmers, vaccinated 81 calves for blackleg and treated poultry for worms.

Leadership development was encouraged largely thru essay contests and public speaking activities. Thrift was encouraged to the extent that 92 percent of the chapter members have savings accounts. The chapter itself is in a fully solvent condition. The chapter recognized the value of good scholarship and offered a prize to the Future Farmer making the best marks in all high-school subjects. Recreation was not overlooked and included competition in baseball, track, rifle, and boxing; camps and tours were planned, and a father-and-son banquet was held.

*Materials for this story and others on these pages were provided by Mr. George Couper, San Luis Obispo, California, and Sherman Dickinson, Columbia, Missouri, who were in charge of publicity for the 1940 convention.

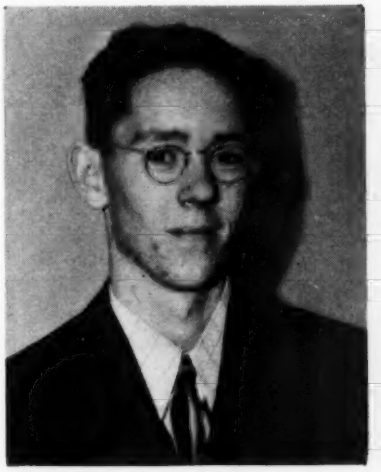
I CANNOT see how any boy who is a student of vocational agriculture can get along without being a member of the F. F. A. No organization can provide such a well-rounded program.—Estes P. Taylor.

Minnesota Official F. F. A. Band



Star American Farmer, 1940

FOLLOWING the death of his father two years ago, Gerald Reyenga, Emmet, Arkansas, took over the operation and management of the 500-acre home farm, which he now owns in partnership with his mother. He had previously developed Future Farmer projects in corn, potatoes, beans, swine, dairy cattle, and cotton. Under this management last year the farm showed a good profit.



Gerald Reyenga

Last year he won a corn production contest with a yield of 82 bushels per acre on a two-acre tract, using cover crops, nitrates, and approved seed. He grows the grain for his own livestock.

Adult farmers look to young Reyenga for suggestions. He is an expert with farm machinery, keeping all the implements needed on the 500-acre tract in good condition.

Many farming activities and the ultimate full responsibility for the farming enterprise of the family have not prevented Gerald from taking part in school affairs. He led his entire senior class in scholarship and each summer he has spent a full week at the state F. F. A. recreational camp at Lake Catherine.

F. F. A. President, 1940-41

The new president of the Future Farmers of America is Harold Pritchard, Booneville, Miss. Other boy officers chosen include: Roy H. Hunt, Vine Grove, Ky., Frank Hill, Montgomery, Vt., Henrie LaMont Miller, East Manti, Utah, James Harley Gunter, Jr., Conway, Texas, Regional-Vice-Presidents; and Earl Elmer Walter, Starkweather, North Dakota, Student Secretary.

Pay 360,000 "Bull Dollars" for a Dairy Bull

The "highest price" bull sold in Newton County, Missouri, was bought by the Neosho Chapter of F. F. A. at the price of 360,000 "bull dollars" which were given away by merchants to purchasers, five "bull dollars" being given for the purchase of one dollar.
The bull, Windmoor Blonde Owl, was sired by Progress Owl of Windmoor, whose first 14 daughters produced 37 percent more fat than their dams.
The Neosho Chapter owns the bull, each member having a share in him. Several members are planning on purchasing purebred heifers and cows. A testing program is also being planned.—Joe Duck, Instructor.

Teaching Farm Level

(Continued from page 153)

B. *Placing terms and figures in table form.*
These terms and figures are placed in table form as follows:

TYPE NOTES FOR FARM LEVEL WORK

STA.	B.S.	H.I.	F.S.	ELEV.*
B.M.	2′5″	102′5″	.....	100′
1.	.....	.....	1′3″	101′2″
2.	.....	.....	2′4″	100′1″
T.P.	3′7″	103′8″	.....	100′1″
3.	.....	.....	4′10″	98′10″

*B. M. is given an Elev. of 100′. Formula to follow: B.S. plus Elev. equals H.I.
H.I. minus F.S. equals Elev.

Things to Note About the Table

1. The first station is called B.M.
2. For any one station, where there is a B.S. reading there is never an F.S. reading and when there is an F.S. reading there is never a B.S. reading.
3. H.I. always remains the same until arriving at a T.P.
4. T.P. and the station immediately preceding it, being the same point, always have the same elevation.
5. B.S. reading on station 2, now called T.P. is added to the elevation of station 2 to obtain the new H.I. Do not add back sights taken on turning points to the elevation given the bench mark.

The above is a simplified form of the notes kept by regular surveyors and are intended for use in farm leveling only.

College President

L. E. Jackson

DR. LYMAN E. Jackson, Junior Dean of the College of Agriculture, Ohio State University, has been appointed president of South Dakota State College at Brookings, South Dakota. Doctor Jackson began his career as a teacher of vocational agriculture. He was engaged in teacher-education work for several years at Ohio State University and was later connected with the United States Department of Agriculture.

Dairy Cattle Nutrition

(Continued from page 146)

Pathology of Rickets in Dairy Calves, Michigan Agricultural Experiment Station Tech. Bul. 150. 1936. (In collaboration with H. E. Bechtel, E. T. Hallman, and C. W. Duncan.)

"Studies on the Chemical Composition of Beef Blood. III. The Blood Picture of Calves on a Sole Diet of Milk or of Milk with the Addition of Various Supplements," *Journal of Biological Chemistry*, 69:101–112, 1926. (In collaboration with C. S. Robinson.)

"Magnesium Studies in Calves. I. Tetany Produced by a Ration of Milk or Milk with Various Supplements," *Journal of Biological Chemistry*, 108:35–44, 1935. (In collaboration with C. W. Duncan and C. S. Robinson.)

"Studies on the Composition of Bovine Blood. II. Seasonal Variations in the Level of Magnesium in the Blood Plasma of Growing Dairy Calves," *Journal of Dairy Science*, 23:125–134, 1940.

"Mineral Studies with Dairy Cattle," *Proceedings of the Eleventh World's Dairy Congress*, Berlin. Vol. 1:397–399, 1937.

"Bulk as a Factor in Formulating Grain Mixtures for Dairy Cattle," *Journal Agricultural Research*, 44:789–796, 1932. (In collaboration with L. A. Moore and M. M. Plum.)

"Rumen Digestion Studies," *Proceedings of the American Society of Animal Production*, pp. 389–393, 1939. (In collaboration with E. B. Hale and C. W. Duncan.)

"A Chemical Study of Ketosis in a Dairy Herd," *Journal American Veterinary Medical Association*, 95:690–700, 1939. (In collaboration with C. W. Duncan and H. A. Tobin.)

Book Review

Judging Dairy Cattle, text by E. S. Harrison, photographs by H. A. Strohmeyer, Jr., and J. T. Carpenter, Jr. Published by John Wiley & Sons, pp. 132, price $2.75. This book was prepared for the purpose of meeting the demand of teachers, students, and livestock managers for an accurate and up-to-date textbook on judging dairy cattle. A period of more than two years was required to collect the many excellent photographs for this manual, and the collection includes some of the most famous animals in the various dairy breeds. The comparisons that are made illustrate real judging problems, and the text material discusses these comparisons in such a way as to stimulate the student to acquire sound judgment based upon the best scientific reasons. Students of vocational agricultural as well as adult workers will find this text especially helpful in developing skills in judging dairy cattle.—A.P.D.

It is just as much a symbol of patriotism to have the nation's schools lighted at night as to have flags flying over them in daytime.— Mark McCloskey.